UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/029,944	12/31/2001	Jung-Im Kim	P67496US0	5264

43569 7590 02/07/2006

MAYER, BROWN, ROWE & MAW LLP
1909 K STREET, N.W.
WASHINGTON, DC 20006

EXAMINER	
TORRES, JOSEPH D	

ART UNIT	PAPER NUMBER
2133	

DATE MAILED: 02/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/029,944	KIM ET AL.	
	Examiner	Art Unit	
	Joseph D. Torres	2133	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 December 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 December 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claims 1-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites, "a repeater for repeatedly outputting predefined bits among 3N total bits output from the first and second convolution encoders such that the ratio of systematic bits to parity bits is at least one systematic bit to every one parity bit". Claim 1 recites the generation of 2 parity bits for every systematic bit followed by repetition. The ratio of parity bits to systematic bit does not change by repetition, e.g., if every systematic bit is repeated once, then the ratio of systematic bits and repeated systematic bits to parity bit 1 to 1, however, the ratio of systematic bits to parity bits remains 1 to 2. Changing the ratio cannot happen without the use of puncturing. The Examiner assumes the Applicant intended --a repeater for repeatedly outputting predefined bits among 3N total bits output from the first and second convolution encoders such that the ratio of systematic bits and repeated systematic bits to parity bits is at least one systematic bit or repeated systematic bit to every one parity bit--

Claims 6 and 10 recite similar language as in claim 1.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

2. Claims 1-3, 6, 7 and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim; Min-Goo et al. (US 6751772 B1, hereafter referred to as Kim).

35 U.S.C. 103(a) rejection of claims 1, 6 and 10.

Kim teaches a first convolutional encoder for receiving N bits to be encoded, generating N systematic bits and N first parity bits, and outputting them (222 in Figure 6 of Kim); an interleaver for receiving the N bits to be encoded, in parallel with the first convolutional encoder, and interleaving the N received bits (226 in Figure 6 of Kim); a second convolutional encoder for receiving the N interleaved bits from the interleaver and generating N second parity bits (224 in Figure 6 of Kim); and a repeater for repeatedly outputting predefined bits among 3N total bits output from the first and second

convolution encoders such that the ratio of systematic bits to parity bits is at least one systematic bit to every one parity bit (231 in Figure 10 of Kim; col. 20, lines 11-21 in Kim teach that only systematic bits are repeated in a turbo encoder; Figure 11 and col. 22, lines 58-61 in Kim teach that parameters Nc, Ni, a and b are selected to rate match for the particular rate of any channel).

Note: Kim clearly suggests the use of a repeater that only repeats the systematic and provides an algorithm with parameters to be used in rate matching a turbo code to any channel rate required by a particular channel.

However Kim does not explicitly teach the specific use of the ratio of systematic bits to parity bits being at least one systematic bit to every one parity bit.

The Examiner asserts that one of ordinary skill in the art at the time the invention was made would recognize that the rate matcher taught in Kim can be used to rate match turbo encoded data to any channel and would know how to select the parameters Nc, Ni, a and b to achieve any particular rate requirement of a channel. Note: if the rate requirement of the channel were 2/3, then 2 systematic bits would be required for every parity bit to achieve such a rate.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Kim by including use of the ratio of systematic bits to parity bits being at least one systematic bit to every one parity bit. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of the ratio of systematic bits to parity bits being at least one systematic bit to

every one parity bit would have provided the ability to rate match to any channel condition (Figure 11 and col. 22, lines 58-61 in Kim teach that parameters Nc, Ni, a and b are selected to rate match for the particular rate of any channel).

35 U.S.C. 103(a) rejection of claims 2 and 11.

Col. 20, lines 11-21 in Kim teach that only systematic bits are repeated in a turbo encoder.

35 U.S.C. 103(a) rejection of claims 3, 7 and 12.

Kim substantially teaches the claimed invention described in claims 1, 2, 6, 10 and 11 (as rejected above). In addition, Kim teaches MUX 240 in Figure 10 of Kim, which can output bits in any conceivable order.

However Kim does not explicitly teach the specific use of outputting signals in the order of the systematic bit, the first parity bit, the systematic bit, and the second parity bit.

The Examiner asserts that that one of ordinary skill in the art at the time the invention was made would have recognized that MUX 240 in Figure 10 of Kim is capable of outputting turbo encoded bit in any conceivable order.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Kim by including use of outputting signals in the order of the systematic bit, the first parity bit, the systematic bit, and the second parity bit. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art

would have recognized that use of outputting signals in the order of the systematic bit, the first parity bit, the systematic bit, and the second parity bit would have provided a means for converting parallel data to serial data.

3. Claims 4, 5, 8, 9, 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim; Min-Goo et al. (US 6751772 B1, hereafter referred to as Kim) in view of Tong; Wen et al. (US 6744744 B1, hereafter referred to as Tong).

35 U.S.C. 103(a) rejection of claims 4, 5, 8, 9, 13 and 14.

Kim substantially teaches the claimed invention described in claims 1-3, 6, 7 and 10-12 (as rejected above).

However Kim does not explicitly teach the specific use of repetitively outputting parity bits of a turbo code.

Tong, in an analogous art, teaches use of repetitively outputting parity bits of a turbo code.

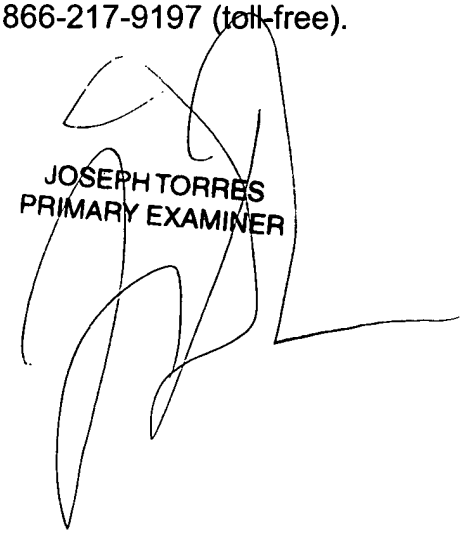
Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kim with the teachings of Tong by including use of repetitively outputting parity bits of a turbo code. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of repetitively outputting parity bits of a turbo code would have provided additional flexibility for rate matching for channel requirements.

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph D. Torres whose telephone number is (571) 272-3829. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (571) 272-3819. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Joseph D. Torres, PhD
Primary Examiner
Art Unit 2133